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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,719	07/28/2003	Masaki Hashimoto	1114-185	7087

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EXAMINER	
DOTE, JANIS L	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/627,719	HASHIMOTO ET AL.	
	Examiner	Art Unit	
	Janis L. Dote	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The examiner acknowledges the amendments to claim 1 and the addition of claims 5 and 6 set forth in the amendment filed on Nov. 23, 2004. Claims 1-6 are pending.

The examiner notes that the originally filed specification provides antecedent basis for the subject matter recited in new claims 5 and 6 at page 13, lines 3-10.

2. The objection to the specification set forth in the office action mailed on Aug. 24, 2004, paragraph 1, has been withdrawn in response to the amended paragraph filed on Nov. 23, 2004, beginning at page 45, line 13, of the specification.

The rejection of claims 1, 3, and 4 under 35 U.S.C. 112, second paragraph, set forth in the office action mailed on Aug. 24, 2004, paragraph 5, has been withdrawn in response to the amendment to claim 1.

3. The examiner notes that the term "controlling means" recited in instant claim 2 is a means-plus-function limitation covered by 35 U.S.C. 112, sixth paragraph. No structure for said term is recited in the claims. The instant specification defines "controlling means" as a "processing circuit that can be implemented by a microcomputer in which a central processing unit (CPU) is mounted. The controlling means **28** includes, for

example, Read Only Memory (ROM), and a controlling program for operating the controlling means **28** is previously stored in the ROM. According to the controlling program that is read from the ROM, the controlling means **28** outputs a controlling signal for controlling the rotational speed of the driving means **24** in response to the thickness of a layer that is the measurement result output from the spectrometer **27**." See the instant specification at page 30, line 24, to page 31, line 9, and Fig. 5.

4. The examiner notes that the instant specification defines the term "maximum peak-to-valley roughness (Ry)" at page 20, lines 1-14, and "with reference to" Fig. 2.

The specification defines the term "centerline average roughness (Ra)" as the average of the absolute values of derivations from the average line m to the roughness curve. See the specification, page 20, line 23, to page 21, line 10.

The specification defines the term "ten-point average roughness (Rz)" at page 21, line 11, to page 22, line 1, and in "with reference to" Fig. 3.

The specification defines the term "average peak-to-peak distance that is an average of a peak-to-peak distance of a cross-sectional curve (Sm)" at page 22, lines 8-14.

The specification defines the term "peak count Pc" at page 13, lines 4-10, and page 22, line 21, to page 23, line 12.

5. Claims 5 and 6 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicants are required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claims 5 and 6 do not further limit the peak count Pc recited in instant claims 1 and 3, from which claims 5 and 6 depend, respectively, because claims 5 and 6 merely recite the definition of the peak count Pc. See the instant specification, page 13, lines 4-10, and page 22, line 21, to page 23, line 12. For example, the specification at page 13, lines 6-10, states that the peak count Pc "is a value obtained by counting the number of peaks having a height of at least the predetermined width of the top point and the bottom point in the reference length . . . ," which is the limitation recited in instant claims 5 and 6.

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Japanese Patent 02-103556 (JP'556). See the USPTO English-language translation of JP'556 for cites.

JP'556 discloses an electrophotographic photoreceptor comprising a conductive substance and a photosensitive layer on the substrate. The conductive substrate has a surface roughness having a maximum height Rmax (i.e., Ry) of 0.8 to 1.0 μm, a Ra of 0.12 to 0.15 μm, a Rz of 0.78 to 0.98 μm, and a Sm of 9 to 11 μm. Translation, page 10, lines 9-22. The values of Rmax, Ra, Rz, and Sm are within the ranges recited in instant claim 1.

JP'556 does not disclose that the conductive substrate has a peak count Pc of 60 to 100 as recited in instant claims 1 and 5. However, as discussed supra, the conductive substrate has a surface roughness that meets the roughness parameters Ry, Ra, Rz, and Sm recited in instant claim 1. JP'556 also discloses that when the photoreceptor is exposed to a single wavelength light, no interference fringes were observed. JP'556 further discloses that the photoreceptor provided images without white voids and black spots. Translation, page 11, lines 3-12. The instant specification at page 23, lines 20-22, discloses that when the conductive substrate has a peak count Pc of less

than 60 and the number of the peaks having large irregularities is small, interference fringes are generated in image formation. Thus, because the conductive substrate disclosed by JP'556 has a surface roughness that meets the surface roughness parameters Ry, Ra, Rz, and Sm, and appears to have the properties sought by applicants, it is reasonable to presume that the conductive substrate disclosed by JP'556 has a surface roughness peak count Pc that is within the range recited instant claim 1. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

The recitation "being exposed to coherent light" in instant claim 1 is a statement of intended use, which does not distinguish the photoreceptor disclosed in JP'556. The recitation of the intended use must result in a structural difference between the claimed invention and the prior art or in a process, a manipulative difference, in order to patentably distinguish the claimed invention from the prior art. See In re Casey, 152 USPQ 235 (CCPA 1967) and In re Otto, 136 USPQ 458, 459 (CCPA 1963). As discussed above, the photoreceptor disclosed by JP'556 appears to meet the compositional limitations recited in the instant claim. Thus, the intended use recited in the instant claim does not result in a difference

between the photoreceptor recited in the instant claim and the photoreceptor disclosed in the cited prior art.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent 2001-027815 (JP'815) combined with JP'556. See the Japanese Patent Office (JPO) machine-assisted English language translation of JP'815 and the USPTO translation of JP'566 for cites.

JP'815 discloses a method of making an electrophotographic photoreceptor comprising the steps of: (1) sequentially coating an undercoat layer, a charge generation layer, and a charge transport layer onto a conductive substrate in a coating apparatus; (2) sequentially measuring the wet film thickness of each layer after coating by an optical interference method; (3) feeding the results from the optical interference measurement to a processing unit, which determines the wet film thickness of the coated layers, estimates a dry film thickness from the wet film thickness, from which a spreading rate for a desired thickness is determined; and (4) controlling the amount of coating coated on the substrate to adjust the thickness of layers by inputting the determined spreading rate from the processing unit to the rotation controller of the lifting device in the coating apparatus. Translation, paragraphs 0013-0017,

0021-0026, 0056-0059, 0062, 0075-0076; and JP'815, Fig. 2. The processing unit is a processing circuit that comprises a computer that computes the wet film thickness, the estimated dry film thickness, and the spreading rate, and controls the coating of the coated layers. Translation, paragraphs 0057-0058. Thus, the processing unit disclosed by JP'556 is within the definition of the "controlling means" recited in instant claim 2. See paragraph 3, supra. According to JP'815, the method disclosed by JP'815 controls the thicknesses of the undercoat layer, the charge generation layer, and the charge transport layer with high precision. Translation, paragraph 0075-0077.

JP'815 does not exemplify the step of preparing a conductive substrate as recited in the instant claim.

JP'556 discloses a method of making a conductive substance for an electrophotographic photoreceptor comprising the step of grinding the surface of an aluminum substrate with a particular grinding tape that is press contacted to the surface of the substrate. Translation of JP'556, page 6, lines 14-21, and page 9, line 20, to page 10, line 8. The resultant conductive substrate has a surface roughness having a maximum height Rmax (i.e., Ry) of 0.8 to 1.0 μm, a Ra of 0.12 to 0.15 μm, a Rz of 0.78 to 0.98 μm, and a Sm of 9 to 11 μm. Translation of JP'556, page 10, lines 9-19. The values of Rmax, Ra, Rz, and Sm are

within the ranges recited in instant claim 2. According to JP'556, a photoreceptor comprising the aluminum substrate disclosed by JP'556 provides images with stable image density without the occurrence of any image flaws, such as scratches, white voids, and black dots, or the development of interference fringes. Translation of JP'556, page 6, lines 6-12, and page 11, lines 7-20.

JP'556 does not disclose that the conductive substrate has a peak count Pc of 60 to 100 as recited in instant claim 2. However, as discussed supra, the conductive substrate has a surface roughness that meets the roughness parameters Ry, Ra, Rz, and Sm recited in instant claim 2. JP'556 also discloses that when a photoreceptor comprising the JP'556 aluminum substrate as the conductive substrate is exposed to a single wavelength light, no interference fringes were observed. JP'556 further discloses that the photoreceptor provided images without white voids and black spots. Translation, page 11, lines 3-12. The instant specification at page 23, lines 20-22, discloses that when the conductive substrate has a peak count Pc of less than 60 and the number of the peaks having large irregularities is small, interference fringes are generated in image formation. Thus, because the conductive substrate disclosed by JP'556 has a surface roughness that meets the surface roughness parameters

Ry, Ra, Rz, and Sm, and appears to have the properties sought by applicants, it is reasonable to presume that the conductive substrate disclosed by JP'556 has a surface roughness peak count Pc that is within the range recited instant claim 2. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'556, to incorporate the step of preparing a conductive substrate as taught by JP'556, such that the resultant substrate has the roughness properties of Rmax (i.e., Ry) of 0.8 to 1.0 μm, a Ra of 0.12 to 0.15 μm, a Rz of 0.78 to 0.98 μm, and a Sm of 9 to 11 μm, in the method disclosed by JP'815, because that person would have had a reasonable expectation of successfully obtaining a method for making electrophotographic receptors that provides images with stable image density without the occurrence of any image flaws, such as scratches, white voids, and black dots, or the development of interference fringes.

9. Claims 3, 4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,239,824 B1 (Mutou) combined with JP'556. See the USPTO translation of JP'556 for cites.

Mutou discloses an image forming apparatus comprising an electrophotographic photoreceptor **10** and an exposure unit **15**.

Col. 4, lines 10-17, and Fig. 1. The exposure unit **15** comprises an infrared semiconductor laser **20**, which emits light having a wavelength of 780 nm. Col. 4, lines 43-46, and Fig. 2. The exposure unit **15** can form electrostatic latent images having a resolution of 1200 dpi. Col. 5, lines 50-54, and col. 6, lines 35-38. The exposure unit **15** meets the exposure apparatus limitations recited in instant claims 3 and 4.

Mutou discloses that the photoreceptor comprises a conductive substrate, an undercoat layer, a charge generation layer, and a charge transport layer. Col. 4, lines 29-34. However, Mutou does not disclose that the conductive substrate has a surface roughness as recited in the instant claims.

JP'556 discloses an aluminum substrate having a surface roughness having a maximum height Rmax (i.e., Ry) of 0.8 to 1.0 μm, a Ra of 0.12 to 0.15 μm, a Rz of 0.78 to 0.98 μm, and a Sm of 9 to 11 μm. According to JP'556, a photoreceptor comprising the aluminum substrate disclosed by JP'556 provides images with stable image density without the occurrence of any image flaws, such as scratches, white voids, and black dots, or the development of interference fringes. The discussion of JP'556 in paragraph 7 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'556, to use the

conductive substrate taught by JP'556 as the conductive substrate in the photoreceptor in the image forming apparatus disclosed by Mutou, because that person would have had a reasonable expectation of successfully obtaining an image forming apparatus that provides images with stable image density without the occurrence of any image flaws, such as scratches, white voids, and black dots, or the development of interference fringes.

The recitation "being exposed to coherent light" in the instant claims is a statement of intended use, which does not distinguish the photoreceptor rendered obvious over the combined teachings of Mutou and JP'556. The recitation of the intended use must result in a structural difference between the claimed invention and the prior art or in a process, a manipulative difference, in order to patentably distinguish the claimed invention from the prior art. See In re Casey, 152 USPQ 235 (CCPA 1967) and In re Otto, 136 USPQ 458, 459 (CCPA 1963). As discussed above, the photoreceptor rendered obvious over the combined teachings of the cited prior art appears to meet the compositional limitations recited in the instant claim. Thus, the intended use recited in the instant claim does not result in a difference between the photoreceptor recited in the instant

claim and the photoreceptor rendered obvious over the combined teachings in the cited prior art.

10. Applicants' arguments filed on Nov. 23, 2004, with respect to the rejections over JP'556 in paragraphs 7-9 above have been fully considered but they are not persuasive.

Applicants assert that the Pc recited in the instant claims is not inherent in JP'556. Applicants assert that the presence of no interference fringe cannot be used to argue that a Pc of from 60-100 is inherent in JP'556. Applicants refer to the disclosure in the specification at page 10, line 25, to page 12, line 27, to support their assertions.

Applicants' assertions are not persuasive. Although applicants are trying to measure the thickness of photosensitive layers in a photoreceptor by optical interferometry, applicants are also trying to prevent the occurrence of interference fringes when the photoreceptor is exposed to a light source in an image forming apparatus. The specification at page 9, lines 9-15, discloses that when the spot diameter of the exposing light is reduced, "the interference fringes may occur, regardless of the rough surface of the substrate of the electrophotographic photoreceptor. Therefore, when the spot diameter of light is small, the surface roughness of the

substrate tends to be made rougher in order to prevent interference fringes from occurring." However, as noted by applicants, the specification, at page 11, lines 10-14, states that "for interference fringes occurring in the images formed in an image forming apparatus having a small light spot, it is difficult to correlate the occurrence of interference fringes and the surface roughness only with Ry, Ra, Rz and Sm." The specification at page 11, lines 14-21, states that the correlation between the occurrence of the interference fringes and the surface roughness can be "clarified" when a peak count Pc is used with the four parameters Ry, Ra, Rz, and Sm of the substrate surface. The specification at page 11, lines 21-23, further states that "the occurrence of the interference fringes is prevented by limiting Ry, Ra, Rz, Sm, and Pc to be within a preferable range." Although the specification at page 11, line 23, to page 12, line 1, discloses that said prevention makes it possible to measure the thickness of a photosensitive layer with high precision by optical interferometry in the area of having rough surface roughness, which is a property sought by applicants, the specification still discloses that the occurrence of the interference fringes using an exposure unit with a "small light spot" can be "prevented by limiting Ry, Ra, Rz, Sm, and Pc to be within a preferable range." As discussed

in the rejections in paragraphs 7 and 9 above, the instant specification at page 23, lines 20-22, further discloses that when the conductive substrate has a peak count Pc of less than 60 and the number of the peaks having large irregularities is small, interference fringes are generated in image formation.

Although JP'556 is silent with respect to measuring the thickness of a photosensitive layer with high precision by optical interferometry, as discussed in paragraphs 7 and 9 above, JP'556 discloses that when a photoreceptor comprising the JP'556 aluminum substrate as the conductive substrate is exposed to a single wavelength light, no interference fringes were observed. JP'556 discloses that light of a single wavelength can be provided by a laser beam. Translation, page 3, line 12. JP'556 further discloses that when photosensitive bodies are used in image forming apparatuses using a single wavelength light, "it is necessary to moderately roughen the surface of the base substance [of photosensitive bodies] so that interference fringes do not develop in the image." Translation, page 3, lines 13-16. JP'556 appears to be also concerned with preventing the occurrence of interference fringes in imaging apparatuses using small spot diameters of light, which also a property sought by applicants. Thus, for the reasons discussed in the rejections in paragraphs 7 and 9 above, it is reasonable

to presume that the conductive substrate disclosed by JP'556 has a surface roughness peak count Pc that is within the range recited instant claims 1, 2, 5, and 6. Applicants have not met their burden to show otherwise. Accordingly, the rejections stand.

11. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The central fax phone number is (703) 872-9306.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to

Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JANIS L. DOTE
PRIMARY EXAMINER
GROUP ~~1500~~ 1700

JLD
Feb. 25, 2005